Unsupervised learning concluding project

Part 1, project proposal

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The paper we chose is “Data-Driven Approach for Credit Card Fraud Detection with Autoencoder and One-Class Classification Techniques” by Abdoul-Fatao Ouedraogo, C´edric Heuchenne, Quoc-Thong Nguyen, and Hien Tran

**Paper summary:**

The paper deals with the problem of credit card fraud. This is a problem which concerns everybody since \_\_\_\_\_\_\_\_\_\_\_\_ **.** The traditional methods for the problem of credit card fraud detection include statistical methods such as rule-based systems, decision trees, and logistic regression.

The paper explores the use of autoencoder and one-class classification techniques for credit card fraud detection. Autoencoder is used to reduce the dimensionality of the data and extract features, while one-class classification is used to identify anomalies in the data, which could indicate potential fraud.

As far as we saw, this approach was not too popular up until this paper and the results they got were impressive compared to the existing ones. We want to use this approach in order to create a larger training set since the amount of training data in fraud is small and the data is very un-balanced.

The upsides and downsides of the approach are like the ones that auto encoders and one-class classification have. The upsides include:

1)Improved accuracy compared to traditional methods.

2)The ability to identify complex and non-linear relationships in the data.

3)The ability to handle high-dimensional and unstructured data.

The downsides of such approaches might be:

1) The potential for overfitting and poor generalization to unseen data

2) The computational cost and complexity of training deep neural networks

3) The need for large amounts of labeled data to train the model effectively